Britan Control

IN THE CLAIMS

A method for classifying facial image the method comprising the steps of:

one a) training a neural network classifier device for recognizing

obtaining corresponding learned models of the factal images used

Ħ unknown facial image to be recognized into said classifier; b) inputting a vector including data representing a portion of

c) classifying said pertion of said unknown facial image according

d) repeating step b) and c) using a different portion of said unknown facial image at each iteration; and,

e) identifying a single class result from said different portions

The method of claim 1, herein said classifying step. at each iteration, comparing a portion of the unknown image against corresponding portion of the learned model image for each Claim 1 (currently amended): A method data, the method comprising the steps at training a neural network class or more facial images and obtaining corresponding learned for training;

b) inputting a vector including unknown facial image to be recoged to a classifying said portion of so a classifying said portion of so to a classifying said portion of so to a classification method;

d) repeating step b) and c) usin unknown facial image at each itee of identifying a single class refigure.

Claim 2 (original): The method of class at each iteration, comparing a post at each iteration of the learned obtaining a confidence score for containing a confidence score for claim 3 (original): The method of claim step e; includes applying a rule to said single class result.

obtaining a confidence score for each classified portion

Claim 3 (original): The method of claim 2, wherein said identifying step e; includes applying a rule to said confidence scores to obtain Claim 4 (previously amended): The method of claim 3, wherein said confidence score is a probability measure that a current portion of an entity of an including obtaining class having majority of class labels determined for unknown facial image is identified with a class, said applied rule each unicnown factal

The method of claim 2, wherein said classifying unknown image being tested and, comparing the decreased portion of the unknown image against a corresponding decreased portion of the learned step-c) includes decreasing at each iteration, the portion of the model image for each class. Claim 5 (original);

decreased from 100% of the urknown facial image to 50% of the unknown Claim 6 (original): The method of claim 5, wherein said portions are **fac**ial image at equal decrenents.

Function Detwork is implemented for training and classifying each image The method of claim 1, wherein a Radial Basis Claim 7 (original): portion.

The method of claim 7, wherein said training step Claim 8 (original): comprises:

initiating the Radial Basis Punction Wetwork, the initializing ster comprising the steps of: a

fixing the network structure by selecting a number of basis a Gaussian functions P, where each basis function I has the output of non-linearity;

determining the basis function means µr where I X-means clustering algorithm; ø

determining a global proportionality factor H, for the bagis. determining the basis function variances $\sigma_{\mathbf{r}}^2$; and function variances by empirical search;

Land Lie presenting the training, the presenting step comprising E steps of:

inputting training parterns X(p) and their class labela C(p)computing the output of the basis function nodes \mathbf{y}_1 (p), classification method, where the pattern index is p to che

resulting from pattern X(p);

x F correlation matrix R of the computing the F basis function outputs;

computing the R x M output matrix B, where d_J is the outpuc classes and desired output and M is the number of 1, - , M; and

determining weights, the determining step comprising the steps ਹ

P correlation matrix R to × (r., inverting the

and

the network solving for the weights in Claim 9 (currently amended): The method of claim 8, wherein the Classifying step further comprises:

presenting each L_{test} portion at each iteration to the classification method; and

classifying each X coat by:

10.00 selecting the output \mathbf{z}_1 with the largest value and classifying \mathbf{t}_1 computing the basis function outputs, for all F basis functions; computing output node setiviations activations; and Portion as a class j

step c} comprises ourputting a class label identifying a class to which probability value indicating the probability with which the unknown. Claim 1D (or ginal): The method of Claim 1, wherein the classifying the detected unknown facial image portion corresponds to and a fagari image pattern belongs to the class.

a neural network classifier device trained for recognizing one or , ...

data comprising:

a neural network classifier device trained for classifying facial, designed as a neural network classifier device trained for recognizing one or. [88]

a neural network classifier device trained for recognizing one or. [88]

with the facial images and generating corresponding learned models associated with the facial image and generating corresponding portion of an unknown facial image to be recognized into said classifier, a different image portion being input to said classifier at each iteration, said classifier device classification method;

method;

method;

method;

method;

method;

method;

classifier includes:

a mechanism for comparing a portion of the unknown image against a corresponding portion of the learned model image for each classified iteration, and, obtaining a confidence score for each classified applies a rule for iteration;

corresponding portion of the learned model image for each classified gention.

portion:

Claim 13 (currently amended): The apparatus of claim 12, wherein said assisted confidence scores to obtain said single class result.

Claim 14 (currently amended): The apparatus of claim 13, wherein said claim 14 (currently amended): The apparatus of claim 13, wherein said claim 14 (currently amended): The apparatus of claim 13, wherein said confidence score is a probability measure that a current portion of an option defined rule of class claim 25 claim 14 (currently amended): The apparatus of claim 13, wherein said confidence score is a probability measure that a current portion of an option indicate having rajority of class labels determined and current portion of an option of class labels determined and current portion of class labels determined and current portions.

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including identifying class having majority of class labels determined for each unknown facial image. Claim 15 (original): The apparatus of claim 12, including nechanism for decreasing each portions of each unknown facial image being tested at the beautiful to be a corresponding decreased portion of the learned model image for against a corresponding decreased portion of the learned model image for

Claim 15 (original): The apparatus of claim 15, wherein said portions decreased from 100% of the unknown facial image to 50% of the unknown facial image at equal decrements.

classifying each image Claim 17 (original): The apparatus of claim 11, wherein a Radial Basis Function Metwork is implemented for training and portion Claim 18 (currently amended): A program storage device readable by: the machine to perform method steps for classifying facial image data, method comprising the steps of:

- one or more facial images and obtaining corresponding learned training a neural network classifier device for recognizing models the facial images used for training;
- 0 #1 (b) inputting a vector including data representing a portion unknown facial image to be recognized into said classifier;

classifying said portion of said unknown facial image

<u>(c</u>

;

He

- said repeating step b) and c) using a different portion of unknown facial image at each iteration; according to a classification method; g
- (e) identifying a single class result from said different postional input to said classifier.

and.

Claim 19 (original): The program scorage device readable by machine as at each iteration, comparing a portion of the unknown laage againing the at each iteration, comparing a portion of the unknown laage againing the corresponding portion of the learned model image for each class; and contidence score for each classified portion.

Claim 20 (original): The program storage device readable by machine as claiming a rule to said confidence scores to obtain said single class result.

Claim 21: A method for classifying facial image data, the method comparising:

Training a classifier device for recognizing one or more facial images and obtaining corresponding learned models the facial images used for training;

Limputing a classifier device for recognizing one or more facial obtaining corresponding learned models the facial images used for training;

Limputing a vector including data representing a portion of any unknown facial image according to a classification method;

Limputing a vector including data representing a different portion of a classification method;

Limputing a single class result from said different portion of and wherein:

The classifier;

And wherein:

And classifier;

And contrain portion of an unknown facial image a probability weaking of current portion of an unknown facial image a probability weaking of current portion of an unknown facial image a probability whigh; and of current portion o that a current portion of an unknown facial image is identified with a 👉 class, the applied rule including obtaining class having majority of class labels determined for each unknown facial image, and

BCOKER the identifying includes applying a rule to said confidence to obtain said single class result.

Ingle class result.

A method for classifying facial image data, the method for classification is a second facial image data, the method for classification is a second facial image data, the method facial image data and the method facial image data a

more facial or training a classifier device for recognizing one

obtaining corresponding learned models the facial images used for

imputting a vector including data representing a portion unknown factal image to be recognized into the classifier; classifying the portion of the unknown facial image according to classification method; repeating the inputting and classifying using a different portion the unknown factal image at each iteration; and, identifying a single class result from the different portions input to the classifier;

a Radial Basis Function Network is implemented for training and classifying each image portion; and

the training includes: initiating the Radial Basis Function Network, the initializing F, using a K-means clustering algorithm; determining the basis function non-linearity; determining the basis function means μ_r where $I=1,\dots,$ including: fixing the network structure by selecting a number of basis variances or ; and determining a global proportionality factor H, for functions F, where each basis function I has the output of a Gaussian the basis function variances by empirical search; compribility of training a classifying the training a classifying the classifying to the unknown factal images and obtaining correspondations.

Compribility correspondations as the classifying the classifying the classifying the classifying to the unknown factal images and classifying the classifying the classifying as Radial Basis to the classifying and wherein:

a Radial Basis influenting the training a K-means warrances or; and the basis functions the presenting the presenting the presenting the training patterns.

presenting the training, the presenting including: inputting $\sim \cos k_{\rm B}^{2} k_{\rm B}^{2}$ method, where the pattern index is p = 1, ..., N; computing the output training patterns X(p) and their class labels C(p) to the classification; computing the F x F correlation matrix R of the basis function outputs; of the basis function nodes \mathbf{y}_1 (p), F, resulting from pattern $\mathbf{X}(\mathbf{p})_{[i]}$

and M is the number of output classes and j = 1, -, M; and determining weights, the determining including: inverting the F. K is determined including in the set of t

and computing the F x N output matrix B, where d, is the desired output and N is the number of output classes and j = 1, - N, and and M is the number of output classes and j = 1, - N, and determining velights, the determining including: inverting the procession matrix B to get B', and solving for the weights in the region of the presenting each Xtest portion at each iteration to the classification method; and computing the basis function outputs, for all F basis functions; and selecting the output zj with the largest value and classifying the computing the output zj with the largest value and classifying the computing the output zj with the largest value and classifying the computing the output zj with the largest value and classifying the computing the output zj with the largest value and classifying the computing to creationing; a classifier device classifying facial image data comprising; a classifier a different image portion being input to the classifier and ifferent image portion being input to the classifier and derestion; the classifier device classifying each the portion of the largest reach iteration; the classifier device classification method; and wherein in the classifier includes: a mechanism for comparing a portion of the largest result from the different includes: a mechanism for comparing a portion of the classifier includes: a mechanism for comparing a portion of the largest large class result from the different includes: a mechanism for comparing a portion of the classifier feveration; and observing the classifier includes: a mechanism for comparing a portion of the classifier includes: a mechanism for comparing a portion of the classifier includes: a mechanism for comparing a portion of the classifier includes: a mechanism for comparing a portion of the largest large class result from the diagnostic device dass result from the diagnostic device device device device classifier.

for each class, at each iteration; and, obtaining a confidence score for each classified portion;

the means for identifying applies a rule to the confidence scores
the confidence score is a probability measure that a current
the confidence score is a probability measure that a current
the confidence score is a probability measure that a current
the confidence score is a probability measure that a current
applied rule including identifying class having najority of class labels
determined for each unknown facial image.

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